

Impact of Daylight Exposure on Sleep Time and Quality of Elementary School Children

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Abstract

The purpose of this study was to examine how daylight exposure affects the health and well-being of elementary school children. Sleep actigraphy data were the main dependent variables in this study. Independent variables were total light and daylight levels elementary school children were exposed to inside their classrooms as well as outside. Participants were composed of elementary school children (46% female, mean age = 7.27 years, ~33% African American) attending a rural and urban schools in the mid-west, each set of children divided into groups according to classroom orientation. Eighty participants in total wore light-sensor equipped actiwatches for one-week to measure sleep quality and exposure to ambient light levels. To assess light levels students were exposed to beyond the one-week of actigraphy measurements, data logging light meters were placed in various locations within the classrooms for an entire semester. Our results seem to indicate that studying in daylit classroom spaces would lead to higher sleep time and quality compared to those who receive little or no daylight. We measured differences as large as 36 minutes. We recommend, therefore, that classroom design need to pay attention to the daily daylight exposures elementary school children are receiving.

Keywords: children, classroom, daylighting, light spectrum, light exposure, sleep quality.